WHAT IS CLAIMED IS:

1. An elevator door system comprising:

an elevator car having a front face defining a door opening;

at least one elevator door coupled to the front face of the elevator car for movement between an open position exposing the door opening and a closed position covering the door opening; and

at least one drive motor disposed on a front portion of the elevator car and disposed between a lower edge and an upper edge of the elevator car, the drive motor being drivingly coupled to the elevator door for moving the elevator door between the open and the closed positions.

2. An elevator door system as defined in claim 1, wherein the drive motor is attached to the elevator door and disposed about midway between upper and lower edges of the elevator door.

3. An elevator door system as defined in claim 1, further including a header bracket mounted on the front face of the elevator car between the lower edge and the upper edge of the elevator car, and wherein the elevator door includes a hangar spaced frontwardly of the front face of the elevator car, and the drive motor is disposed forwardly of the front face of the car and rearwardly of the hangar.

4. An elevator door system as defined in claim 3, wherein the header bracket is disposed below the upper edge of the elevator car and generally above the door opening, the header bracket extending generally between first and second sides of the door opening, and wherein the drive motor is mounted on the header bracket.

5. An elevator door system as defined in claim 3, wherein the drive motor is disposed generally adjacent to the first side of the door opening and includes a first sheave, and further comprising a second sheave mounted on the header bracket generally at the second side of the door opening, a rope forming a closed loop about the first and the second sheaves, and means for attaching the door to the rope.

6. An elevator door system as defined in claim 5, wherein the rope defines upper and lower portions each extending between the first and the second sheaves, and further comprising another door and another means for coupling the other door to the rope, one coupling means attaching an associated door to an upper portion of the rope, and the other coupling means attaching the other door to a lower portion of the rope such that the doors move in opposite directions relative to one another as the drive motor moves the rope about a portion of the closed loop.

7. An elevator door system as defined in claim 1, wherein the elevator door includes a hangar spaced frontwardly of the front face of the elevator car, the drive motor is a motor roller, and further including an upper header bracket having a roller track mounted on the front face of the elevator car between the lower edge of the elevator car and generally above the door opening, the motor roller being disposed frontwardly of the front face of the elevator car and rearwardly of the hangar, and the motor roller being attached to the hangar and rotatably engaging an upper edge of the roller track for supporting and moving the elevator door between the open and the closed positions.

8. An elevator door system as defined in claim 1, wherein the elevator door includes upper and lower hangars spaced frontwardly of the front face of the elevator car, and further including an upper header bracket having an upper roller track mounted on the front face of the elevator car between the lower edge of the elevator car and generally above the door opening, and a first upper roller disposed frontwardly of the front face of the elevator car and rearwardly of the upper hangar, the first upper roller being attached to the upper hangar and rotatably engaging an upper edge of the roller track for supporting and moving the elevator door between the open and the closed positions, and further including an lower header bracket having a lower roller track mounted on the front face of the elevator car between the lower edge of the elevator car and generally below the door opening, and a first lower roller disposed frontwardly of the front face of the elevator car and rearwardly of the lower hangar, the first lower roller being attached to the lower hangar and rotatably engaging an upper edge of the lower roller track for supporting and moving the elevator door between the open and the closed positions, and wherein at least one of the rollers is a motor roller serving as the drive motor.

9. An elevator door system as defined in claim 8, further including a second upper roller attached to the upper hangar and rotatably engaging the upper edge of the upper roller track, and a second lower roller attached to the lower hangar and rotatably engaging the upper edge of the lower roller track.

10. An elevator door system as defined in claim 9, further including means for synchronizing the rotation of the rollers.

11. An elevator door system as defined in claim 10, wherein one of the rollers is a motor roller, and the synchronizing means includes a rope drivingly coupled to and forming a closed loop about the upper and lower rollers for smoothly transferring the rotational movement of the motor roller to the other rollers.

12. An elevator door system as defined in claim 10, wherein at least one upper roller and at least one lower roller is a motor roller, and the synchronizing means includes a control system electrically coupled to the motor rollers for synchronizing the rotation of the motor rollers.

13. An elevator door system as defined in claim 12, wherein the control system includes a power stage for each motor roller to provide redundancy in case a power stage should fail.

14. An elevator door system as defined in claim 1, wherein the elevator door includes a hangar spaced frontwardly of the front face of the elevator car, and further including a rope fixed at each end and extending generally between first and second sides of a door opening, and the drive motor includes a traction sheave attached to the hangar and rotatably engaging the rope to move the door along the rope between open and closed positions as the traction sheave is rotated.

15. An elevator door system as defined in claim 14, further including a roller track extending generally between the first and second sides of the door opening, and at least one track roller attached to the hangar and rotatably engaging the roller track.

16. An elevator door system comprising:

an elevator car having a front face defining a door opening;

at least one elevator door coupled to the front face of the elevator car for movement between an open position exposing the door opening and a closed position covering the door opening; and

at least one flat drive motor disposed on a front portion of the elevator car and drivingly coupled to the elevator door for moving the elevator door ~~between the open and the closed positions~~.

17. An elevator door system as defined in claim 16, wherein the flat drive motor is mounted on the front face of the elevator car and disposed between a lower edge and an upper edge of the elevator car.

18. An elevator door system as defined in claim 17, further including a header bracket mounted on the front face of the elevator car between the lower edge and the upper edge of the elevator car, and wherein the elevator door includes a hangar spaced frontwardly of the front face of the elevator car, and the flat drive motor is disposed forwardly of the front face of the car and rearwardly of the hangar.

19. An elevator door system as defined in claim 18, wherein the header bracket is disposed below the upper edge of the elevator car and generally above the door opening, the header bracket extending generally between first and second sides of the door opening, and wherein the flat drive motor is mounted on the header bracket.

20. An elevator door system as defined in claim 18, wherein the flat drive motor is disposed generally adjacent to the first side of the door opening and includes a first sheave drivingly coupled to the flat drive motor, and further comprising a second sheave mounted on the header bracket generally at the second side of the door opening, a rope forming a closed loop about the first and the second sheaves, and means for attaching the door to the rope.

21. An elevator door system as defined in claim 20, wherein the rope defines upper and lower portions each extending between the first and the second sheaves, and further comprising another door and another means for coupling the other door to the rope, one coupling means attaching an associated door to an upper portion of the rope, and the other coupling means attaching the other door to a lower portion of the rope such that the doors move in opposite directions relative to one another as the flat drive motor moves the rope about a ~~portion of the closed~~ loop.

22. An elevator door system as defined in claim 16, wherein the elevator door includes a hangar spaced frontwardly of the front face of the elevator car, the flat drive motor is a motor roller, and further including an upper header bracket having a roller track mounted on the front face of the elevator car between the lower edge of the elevator car and generally above the door opening, the motor roller being disposed frontwardly of the front face of the elevator car and rearwardly of the hangar, and the motor roller being attached to the hangar and rotatably engaging an upper edge of the roller track for supporting and moving the elevator door between the open and the closed positions.

23. An elevator door system as defined in claim 16, wherein the elevator door includes upper and lower hangars spaced frontwardly of the front face of the elevator car, and further including an upper header bracket having an upper roller track mounted on the front face of the elevator car between the lower edge of the elevator car and generally above the door opening, and a first upper roller disposed frontwardly of the front face of the elevator car and rearwardly of the upper hangar, the first upper roller being attached to the upper hangar and rotatably engaging an upper edge of the roller track for supporting and moving the elevator door between the open and the closed positions, and further including an lower header bracket having a lower roller track mounted on the front face of the elevator car between the lower edge of the elevator car and generally below the door opening, and a first lower roller disposed frontwardly of the front face of the elevator car and rearwardly of the lower hangar, the first lower roller being attached to the lower hangar and rotatably engaging an upper edge of the lower roller track for supporting and moving the elevator door between the open and the closed positions, and wherein at least one of the rollers is a motor roller serving as the flat drive motor.

24. An elevator door system as defined in claim 23, further including a second upper roller attached to the upper hangar and rotatably engaging the upper edge of the upper roller track, and a second lower roller attached to the lower hangar and rotatably engaging the upper edge of the lower roller track.

25. An elevator door system as defined in claim 24, further including means for synchronizing the rotation of the rollers.

26. An elevator door system as defined in claim 25, wherein one of the rollers is a motor roller, and the synchronizing means includes a rope drivingly coupled to and forming a closed loop about the upper and lower rollers for smoothly transferring the rotational movement of the motor roller to the other rollers.

27. An elevator door system as defined in claim 25, wherein at least upper roller and at least one lower roller is a motor roller, and the synchronizing means includes a control system electrically coupled to the motor rollers for synchronizing the rotation of the motor rollers.

28. An elevator door system as defined in claim 27, wherein the control system includes a power stage for each motor roller to provide redundancy in case a power stage should fail.

29. An elevator door system as defined in claim 16, wherein the elevator door includes a hangar spaced frontwardly of the front face of the elevator car, and further including a rope fixed at each end and extending generally between first and second sides of a door opening, and the drive motor includes a traction sheave attached to the hangar and rotatably engaging the rope to move the door along the rope between open and closed positions as the traction sheave is rotated.

30. An elevator door system as defined in claim 29, further including a roller track extending generally between the first and second sides of the door opening, and at least one track roller attached to the hangar and rotatably engaging the roller track.

31. An elevator door system as defined in claim 16, wherein the flat drive motor is a permanent magnet motor having an external rotor serving as a sheave.

32. An elevator door system as defined in claim 16, wherein the flat drive motor is a motor assembly including a ring torque motor drivingly coupled to and disposed to a side of a sheave.

Fig. 9 is not external rotor

33. An elevator door system as defined in claim 16, wherein the flat drive motor is a motor assembly including a ring torque motor drivingly coupled to and disposed to a side of a sheave.

34. An elevator door system as defined in claim 16, wherein the flat drive motor is a motor assembly including a cycloidal-gear and disc motor drivingly coupled to and disposed to a side of a sheave.

35. An elevator door system as defined in claim 16, wherein the flat drive motor is a motor assembly including a cycloidal-gear and disc motor drivingly coupled to a sheave, the cycloidal-gear being disposed within the sheave, and the disc motor being disposed to a side of the sheave.

36. An elevator door system as defined in claim 16, wherein the flat drive motor is a motor assembly including a ring torque motor drivingly coupled to and disposed within a sheave.

37. An elevator door system as defined in claim 16, wherein the flat drive motor is a motor assembly including a ring torque motor drivingly coupled to and disposed within a roller.

38. An elevator door system as defined in claim 16, wherein the flat drive motor is a motor assembly including a cycloidal-gear and disc motor drivingly coupled to a roller, the cycloidal-gear being disposed within the roller, and the disc motor being disposed to a side of the roller.